

(a) providing an EPSP synthase nucleic acid segment derived from a gene that encodes an EPSP synthase; and

(b) recombining the EPSP synthase nucleic acid segment with the plurality of nucleic acid segments to produce the library of recombinant nucleic acids.

66. (new) The method of claim 65, wherein the EPSP synthase nucleic acid segment is derived from the S3P binding region of an EPSP synthase gene.

67. (new) The method of claim 28, wherein the additional nucleic acid is derived from a gene that encodes an EPSP synthase.

### REMARKS

#### *1. Status of the claims*

With this Amendment, claims 1-3, 5, 9, 10, 12, 13, 17, 21, 25-27, 29 and 31 are cancelled; claims 4, 6-8, 11, 14, 19, 20, 22-24, 28, 30, 32-35 and 37 are amended without prejudice to further prosecution and new claims 62-67 are added. Thus, claims 4, 6-8, 11, 14-16, 18-20, 22-24, 28, 30, 32-27 and 61-67 are pending and under consideration with entry of this Amendment.

A marked up copy of the amended claim is provided as an appendix entitled "MARKED COPY OF AMENDED CLAIMS." A courtesy copy of the pending claims as amended is also included.

#### *2. Support for the Amendments*

Support for the amendments to the claims can be found throughout the specification, the drawings, and the claims as originally filed. No new matter is introduced by this Amendment.

Claim 4 has been amended to recite that the recombinant herbicide tolerance nucleic acid encodes an herbicide tolerance polypeptide, as opposed to a nucleic acid which can confer tolerance to an herbicide upon a cell or which encodes a polypeptide with an activity that confers herbicide tolerance to a cell. This amendment is discussed in more detail below in Section 3.

Claim 4 has also been amended to recite that expression of the herbicide tolerance polypeptide at effective levels in a cell renders the cell tolerant towards an herbicide. One of skill in the art will recognize that there are potential modes of expression where the expressed herbicide tolerance polypeptide might be inoperative, e.g., the polypeptide is expressed at levels

too low to be effective, or localized in some region of a plant or plant cell where it would not be effective. In the context of the invention and specification as filed, the term "effective levels" is intended to ensure the operability of the invention by requiring that the polypeptide be expressed in a manner and at sufficient levels so as to be operative and effective. It is desirable and proper to use claim language to exclude inoperative embodiments. See, e.g., MPEP 2164.08(b).

Claim 4 has also been amended to recite a plurality of variant forms of a gene, as opposed to variant forms of "one or more parental nucleic acids." This amendment is discussed in more detail below in Section 3.

Claim 4 has further been amended to recite that the gene encodes a UDP-N-acetylglucosamine enolpyruvyltransferase. This limitation originally appeared in claim 11, and is described in the specification, e.g., at page 35, line 25 to page 36, line 27.

Finally, claim 4 has been amended to recite screening the library to detect (rather than identify) a recombinant herbicide tolerance nucleic acid. This amendment is also discussed in more detail below in Section 3.

Claims 6-8, 11, 14, 19, 20, 22-24, 28, 30, 32-37 and 61 have all been amended to render them consistent with the language of claim 4 as amended.

New claims 62-67 find support in the specification, e.g., at page 35, line 25 to page 36, line 27.

### **3. *Rejections Under 35 U.S.C. § 112, second paragraph***

Pending claims 4, 6-8, 11, 14-16, 18-20, 22-24, 28, 30, 32-37 and 61 were rejected as indefinite under 35 U.S.C. 112, second paragraph. The claims as amended are fully supported by the specification as filed and comply with the statute, as explained in detail below, and it is respectfully requested that this rejection be withdrawn.

#### **A. *Recitation of a final process step***

Claims 4, 6-8, 11, 14-16, 18-20, 22-24, 28, 30, 32-37 and 61 were rejected for allegedly failing to recite a final process step that clearly relates back to the claim preamble. In particular, the Examiner finds it to be unclear whether the claims "are intended to be limited to methods of 'identifying' any 'herbicide tolerance nucleic acid which can confer tolerance,' or to only herbicide tolerance nucleic acids that encode 'a polypeptide with an activity that confers herbicide tolerance to a cell.'"

The claims as amended are directed to a method for obtaining a recombinant herbicide nucleic acid that encodes an herbicide tolerance polypeptide (see the preamble of claim

4). Step (c) of claim 4 recites screening the library to detect a recombinant herbicide tolerance nucleic acid that encodes an herbicide tolerance polypeptide. Thus the final process step clearly relates back to the preamble. Withdrawal of this ground for rejection is respectfully requested.

**B. "Derived"**

Prior to the present amendment claims 4, 6-8, 11, 14-16, 18-20, 22-24, 28, 30, 32-37 and 61 recited a plurality of nucleic acid segments "derived from a plurality of variant forms of one or more parental nucleic acids." The Examiner found the recitation of the term "derived," at least in this context, to render the claim indefinite.

As noted by the Examiner, the term "nucleic acid derived from a gene" is explicitly defined in the specification (page 16, lines 16-20). While acknowledging that "a nucleic acid segment" is a type of nucleic acid, the Examiner maintains that a gene is not the equivalent of a "plurality of variant forms of one or more parental nucleic acids."

Claim 4 has been amended to recite "a plurality of nucleic acid segments derived from a plurality of variant forms of a gene." This language closely tracks the "nucleic acid derived from a gene" language specifically defined in the specification. "Nucleic acid segments" are simply types of "nucleic acids," as previously noted by the Examiner. In the same manner, "variant forms of a gene" are simply types of "genes." The term "plurality of variant forms" of a nucleic acid is explicitly defined in the specification at page 10, lines 17-29, and the term "gene" is explicitly defined at page 15, lines 23-29 as a type of DNA, i.e., a nucleic acid. Thus, it is believed the amendment addresses the Examiner's definiteness concerns, and it is respectfully requested that this ground of rejection be withdrawn.

It should be noted that the amendment represents an attempt to arrive at language that satisfies both the Examiner and Applicant, thereby obviating the ground of rejection. Applicant's position remains that even prior to this amendment the claim was sufficiently definite to satisfy 35 U.S.C. 112, second paragraph, and that the amendment does not substantively narrow the scope of the claim. In particular, prior to amendment the claim recited nucleic acid segments derived from variant forms of a parental nucleic acid that encodes a polypeptide. The specification defines the term "gene" as encompassing any DNA that encodes a polypeptide (page 15, line 23-25). Given this definition of "gene," read in light of the definition of "derived from a gene" (page 16, lines 15-20), it is clear that any nucleic acid segment derived from a nucleic acid that encodes a polypeptide must ultimately derive from a "gene," i.e., DNA encoding the polypeptide ultimately served as the template for the fragment, as

illustrated by the examples at page 16, lines 16-20. It is Applicants' position that this amendment has not altered the scope of the claim.

**C. "Identify"**

Claims 4, 6-8, 11, 14-16, 18-20, 22-24, 28, 30, 32-37 and 61 were rejected as indefinite for using the term "identify." The Examiner indicated that if the claims required "detection" of a nucleic acid sequence (rather than "identification") the meaning of the claims would be apparent to one of skill in the art. Claim 4 as amended recites "screening the library to detect a recombinant herbicide tolerance nucleic acid." Withdrawal of this ground for rejection is respectfully requested.

**D. Claim 22**

Claim 22 was rejected as indefinite for reciting "nucleic acid encodes an activity." The claim has been amended to recite "nucleic acid encodes a polypeptide," obviating this ground of rejection. Withdrawal of this ground for rejection is respectfully requested.

**E. Claim 11**

Claim 11 was rejected based on lack of antecedent basis for the limitation "the parental nucleic acid." Claim 11 as amended does not recite this limitation, obviating this ground of rejection. Withdrawal of this ground for rejection is respectfully requested.

**F. Claims 19 and 20**

Claims 19 and 20 were rejected based on lack of antecedent basis for the limitation "the activity encoded by the recombinant herbicide tolerance nucleic acid." The claims have been amended to recite "the herbicide tolerance polypeptide," for which antecedent basis lies in the ultimate parent claim of the claim (claim 4).

**4. Rejections Under 35 U.S.C. § 103**

Claims 4, 6-8, 14-16, 18-20, 22-24, 28, 30, 32-37 and 61 have been rejected as obvious under 35 U.S.C. 103. However, claim 11 was not rejected under Section 103, or under any other grounds except for indefiniteness under 35 U.S.C. 112, second paragraph. Prior to this amendment, claim 11 recited that the parental nucleic acid (i.e., the "gene" in the language of the amended claims) encodes a UDP-N-acetylglucosamine enolpyruvyltransferase, which apparently rendered the claim novel and nonobvious in the Examiner's judgment. Without intending to prejudice their rights to at a later time pursue any of the originally claimed and/or disclosed subject matter in this or any other application, Applicants have amended all pending claims to

**PATENT**  
**Atty. Docket No: 0113.410US**  
**USSN 09/373,333**

recite the limitation that the gene encodes a UDP-N-acetylglucosamine enolpyruvyltransferase.

It is believed that this amendment obviates all grounds for rejection under 35 U.S.C. 103.

Withdrawal of this rejection is respectfully requested.

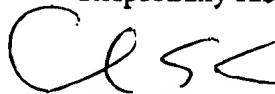
**CONCLUSION**

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-298-5884.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 50-0990.

Respectfully submitted,



Christopher M. Holman  
Reg. No. 40,021

*Marked Copy Of Amended Claims for**USSN 09/373,333*

4. (twice amended) A method of obtaining a recombinant herbicide tolerance nucleic acid [which can confer tolerance to an herbicide upon a cell in which the recombinant herbicide tolerance nucleic acid is present] that encodes an herbicide tolerance polypeptide, wherein expression of the herbicide tolerance polypeptide at effective levels in a cell renders the cell tolerant towards an herbicide, the method comprising:

[(i)] (a) providing a plurality of nucleic acid segments[, which nucleic acid segments are] derived from a plurality of variant forms of [one or more parental nucleic acids] a gene, wherein [one or more of the parental nucleic acids encodes a polypeptide with an herbicide tolerance activity] the gene encodes a UDP-N-acetylglucosamine enolpyruvyltransferase;

[(ii)] (b) recombining the plurality of nucleic acid segments to produce a library of recombinant nucleic acids; and

[(iii)] (c) screening the library to [identify at least one] detect a recombinant herbicide tolerance nucleic acid [which encodes a polypeptide with an activity that confers herbicide tolerance to a cell] that encodes an herbicide tolerance polypeptide, wherein expression of the herbicide tolerance polypeptide at effective levels in the cell renders the cell tolerant towards the herbicide.

6. (twice amended) The method of claim [1 or] 4, wherein the plurality of variant forms comprises allelic or interspecific variants of [one or more parental nucleic acids] the gene.

7. (twice amended) The method of claim [1 or] 4, wherein the plurality of variant forms is produced by synthesizing a plurality of nucleic acids homologous to the [one or more parental nucleic acids] gene.

8. (twice amended) The method of claim [1 or] 4, wherein the plurality of variant forms is produced by error-prone transcription of the [one or more parental nucleic acids] gene or by replication of the [one or more parental nucleic acids] gene in a mutator cell strain.

11. (amended) The method of claim [5, wherein the parental nucleic acid encodes a UDP-N-acetylglucosamine enolpyruvyltransferase, and] 4, wherein the herbicide is glyphosate.

14. (twice amended) The method of claim [1 or] 4, wherein the library of recombinant nucleic acids is present in a population of cells.

19. (amended) The method of claim 18, wherein enhanced growth of the cell requires the [activity encoded by the recombinant herbicide tolerance nucleic acid] expression of the herbicide tolerance polypeptide at effective levels in the cell.

20. (amended) The method of claim 19, wherein enhanced growth of the cell requires [the product of the reaction of the herbicide by the activity encoded by the recombinant herbicide tolerance nucleic acid] a product of a reaction catalyzed by the herbicide tolerance polypeptide.

22. (amended) The method of claim 19, wherein the cells are an AroA<sup>-</sup> strain of bacteria, the herbicide is glyphosate, and the recombinant herbicide tolerance nucleic acid encodes [an activity which catalyzes] a polypeptide that catalyzes the conversion of phosphoenolpyruvate plus shikimate-3-phosphate to 5-enolpyruvylshikimate-3-phosphate.

23. (twice amended) The method of claim [1 or] 4, the method further comprising screening the library for [one or more] an additional activity that confers tolerance to [one or more additional herbicides] an additional herbicide.

24. (twice amended) The method of claim [1 or] 4, wherein the recombining is performed in a population of cells.

28. (twice amended) The method of claim [1 or] 4, wherein the method further comprises:

[(iv)] (d) recombining [at least one] a recombinant herbicide tolerance nucleic acid detected in step (c) with an additional nucleic acid, wherein the additional nucleic acid is the same or different from [one or more of the variant forms of (i)] the plurality of variant forms of a gene of step (a), to produce an additional library of recombinant nucleic acids; and

[(v)] (e) screening the additional library to [identify at least one additional] detect a recombinant herbicide tolerance nucleic acid that encodes an herbicide tolerance polypeptide [with an additional improved herbicide tolerance activity compared to a non-recombinant herbicide tolerance nucleic acid] ,wherein expression of the herbicide tolerance polypeptide at effective levels in the cell renders the cell tolerant towards the herbicide; and, optionally

repeating [(iv) and (v)] steps (d) and (e).

30. (twice amended) The method of claim [1 or] 4, wherein the library of recombinant nucleic acids is present in bacterial cells and the screening step [(iii)] comprises:

pooling a plurality of cells each comprising a separate member of the library produced in step [(ii)] (b);

screening the resulting pooled cells to detect a recombinant herbicide tolerance nucleic acid that encodes an herbicide tolerance polypeptide [with a distinct or improved tolerance activity compared to a non-recombinant herbicide tolerance nucleic acid] , wherein expression of the herbicide tolerance polypeptide at effective levels in the cell renders the cell tolerant towards the herbicide; and

isolating the recombinant herbicide tolerance nucleic acid [encoding the polypeptide with the distinct or improved herbicide tolerance activity].

32. (twice amended) The method of claim [1 or] 4, further comprising transducing the recombinant herbicide tolerance nucleic acid into a plant.

33. (twice amended) The method of claim [1 or] 4, further comprising transducing the recombinant herbicide tolerance nucleic acid into a plant and testing the resulting transduced plant for tolerance to an herbicide.

34. (twice amended) The method of claim [1 or] 4, further comprising transducing the recombinant herbicide tolerance nucleic acid into a plant and breeding the plant with another plant strain of the same species, and selecting resultant offspring for tolerance to an herbicide.

35. (twice amended) A library of recombinant nucleic acids made by the method of claim [1 or] 4.

37. (twice amended) A recombinant herbicide tolerance nucleic acid made by the method of claim [1 or] 4.

61. (amended) The method of claim [1 or] 4, further comprising isolating or recovering the [at least one identified] recombinant herbicide tolerance nucleic acid [which encodes a polypeptide with an activity that confers herbicide tolerance].